US-PAT-NO: **6608818**

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TITLE: Radio link protocol enhancements to reduce setup time
              for data calls

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US Patent No. - PN (1):
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Brief Summary Text - BSTX (12):
    Several protocol layers typically reside above the RLP layer. **IP** datagrams,
for example, are typically **converted into a Point-To-Point Protocol** (PPP) byte
stream before being presented as a byte stream to the RLP protocol layer. As
the RLP layer ignores the protocol and framing of higher protocol layers, the
stream of data transported by RLP is said to be a "featureless byte stream".

Detailed Description Text - DETX (3):
    Subscriber station 102 and base station 104 establish a radio link protocol
(RLP) communication link to convey data byte streams through wireless
communication channel 106. The data bytes exchanged between subscriber station
102 and network 108 through base station 104 may be Internet **Protocol (IP)
datagrams converted into a byte stream using such conversion protocols** as
point-to-point protocol (PPP). Both IP and PPP protocols are well known in the
art.

Detailed Description Text - DETX (19):
    In the preferred embodiment, the **format** of each of the messages (Service
Request Message 302, Service Response Messages 304 and 308 and Service Connect
Message 308) is as described in the aforementioned IS-2000 specification. In
the preferred embodiment, each of the messages includes an RLP_BLOB section,
which is a new form of BLOB adapted for RLP negotiation purposes. BLOB in
IS-2000 is short for "block of bits." In the preferred embodiment, the RLP_BLOB
includes the initial RTT estimate to be used and the NAK scheme. An exemplary
format for RLP_BLOB is described in Table 1 below.

Detailed Description Text - DETX (20):
    In Table 1, the RLP_BLOB_ID field indicates a version number of the RLP_BLOB
format used to interpret the rest of the contents of the RLP_BLOB section. RTT
is the initial RTT value to be used in the call. NAK_ROUNDS_FWD indicates the

number of NAK rounds to be used for forward link RLP transmissions. NAK_ROUNDS_REV indicates the number of NAK rounds to be used for reverse link RLP transmissions. As indicated, the NAK_ROUNDS_REV field is followed by a number of NAK_PER_ROUND_FWD fields corresponding to the value in the NAK_ROUNDS_FWD field. The last of the NAK_PER_ROUND_FWD fields is followed by a number of NAK_PER_ROUND_REV fields corresponding to the value in the NAK_ROUNDS_REV field. If the NAK_ROUNDS_FWD field has a value of zero, then the NAK_PER_ROUND_REV fields (if any) will immediately follow the NAK_ROUNDS_REV field.

Detailed Description Text - DETX (26):

FIG. 3b is a diagram showing a variation of the improved message flow used to establish an RTT estimate for a base station originated RLP call in accordance with an embodiment of the invention. In contrast to a subscriber station originated call, in a base station originated call Service Request Message 342 is transmitted by base station 104 and Service Response Message 344 is transmitted by subscriber station 102. Service Connect Message 308 has the same **format** and content discussed above. As shown, base station 104 begins transmitting forward RLP data frames 310 immediately after Service Connect Message 308. Upon receiving Service Connect Message 308, subscriber station 102 begins transmitting reverse RLP data frames 312.

Detailed Description Text - DETX (49):

The apparatus shown includes data interface 602 that may be connected an external input/output device, for example a display terminal or handheld or laptop computer. Data interface 602 may be omitted if subscriber station 102 further includes an internal user interface, for example, a keypad and a display. For example, subscriber station 102 might be a CDMA wireless personal data assistant (**PDA**) capable of exchanging data with the Internet and displaying it on a liquid crystal display (LCD).